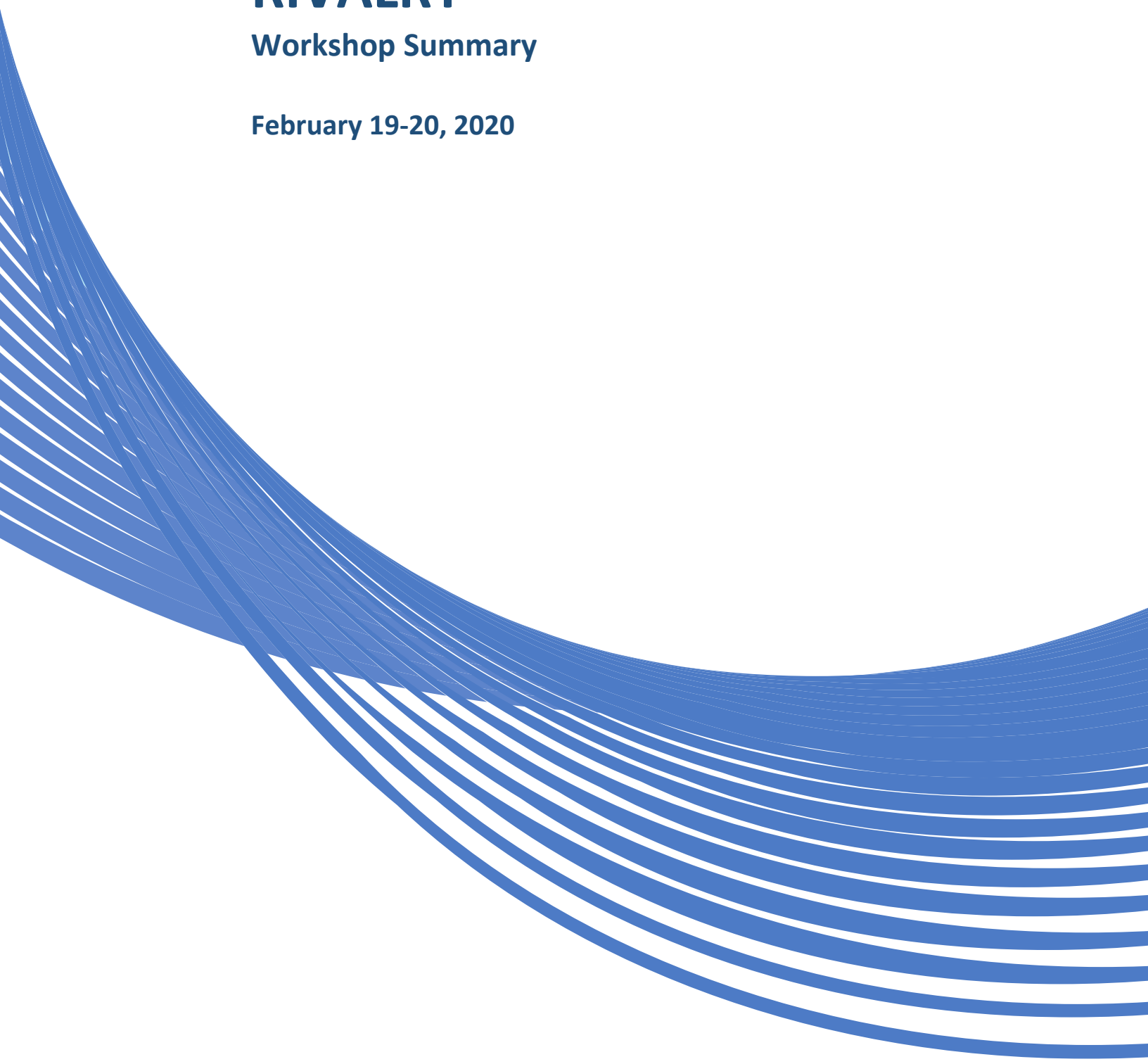
NUCLEAR RISK REDUCTION IN AN ERA OF MAJOR POWER RIVALRY

Workshop Summary

February 19-20, 2020



Center for Global Security Research
LAWRENCE LIVERMORE NATIONAL LABORATORY

Workshop Summary

Nuclear Risk Reduction in an Era of Major Power Rivalry

Center for Global Security Research
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On February 19-20, the Center for Global Security Research (CGSR) at Lawrence Livermore National Laboratory (LLNL) hosted a workshop titled "Nuclear Risk Reduction in an Era of Major Power Rivalry." This session brought together participants drawn across the policy, military, and technical communities. Among the participants, there were experts from allied countries in Europe and the Asia-Pacific region, as well as experts from Russia and China.

Discussion was guided by the following key questions:

1. What are the most serious nuclear dangers and risks today?
2. Where do we stand with the international project to reduce those dangers and risks?
3. What new approaches can usefully be pursued? Bilateral? Multilateral? Unilateral?
4. How does the global geopolitical landscape affect the prospects for success?

Key take-aways:

1. A global view of nuclear dangers and risks is difficult to formulate because perceived risk is a function of strategic circumstance. The major powers each perceive a distinct set of risks. However, there is a broad consensus that nuclear dangers and risks have increased over the last decade and continue to increase. A particular concern attaches to the possibility of accidental or inadvertent escalation of a regional conflict between nuclear-armed adversaries, arising from technical malfunctions or mistakes by decision-makers or operators. Attention must also be paid to intentional escalation—that is, a decision to employ one or more nuclear weapons with the expectation that this would induce a de-escalatory response from the attacked party.

2. The strategies to reduce nuclear risks are as varied as the risks. A central role has been played by bilateral arms control between the United States and the Soviet Union, now Russia. Multilateral arms control in the form of the NPT has also contributed significantly to global risk reduction. Unilateral measures by the United States and others

[1] *The views and opinions expressed herein do not necessarily state or reflect those of the United States government, Lawrence Livermore National Security, LLC. or any other organization.*

have occasionally played a constructive role (e.g., the Presidential Nuclear Initiatives of the 1990s). Cooperative threat reduction programs between the United States and the Soviet successor states also contributed.

3. At a time of rising demand for more effective nuclear risk reduction, the marketplace of ideas is crowded. But the practical options for reducing risks appear to be few, given political factors in each of the stakeholder countries. A practical agenda should include the following:

- To reduce the risks of major power arms racing and of a further erosion of the NPT, a trilateral US-Russia-China arms control agreement would be helpful. But it appears highly unlikely absent a US willingness to relax sanctions and/or reimpose legal restraints on missile defenses. A sequential process may be possible.
- To reduce fears of an arms race, extension of New START would be useful. Such extension would promote predictability and transparency. But it would only defer the difficult question about what comes next.
- To reduce the risks of crisis mismanagement by the major powers, a broadening of the ongoing nuclear dialogue among the five nuclear weapon states would be useful. It also appears possible, given their shared interest in sustaining the taboo against nuclear employment.
- To help reduce the risks of miscalculation arising from misunderstanding, and to help ensure leadership focus on nuclear risks, strategic dialogue between and among Russia, China, the United States, and its allies should occur on a sustained, substantive, high-level basis. This should include both Tracks 1 and 1.5.
- To reduce the risk of nuclear employment in regional wars, attention must be given to ensuring effective deterrence. This must include both a credible capability for conventional defense and a credible threat to retaliate by nuclear means in response to limited nuclear attack.

Panel 1: Taking Stock of Nuclear Dangers and Risks in 2020

- What are the principal dangers and risks today?
- Are dangers and risks rising, falling, or just changing?
- How does the emerging competition over disruptive technologies affect nuclear risk?

This panel examined the landscape of modern nuclear dangers and risks and set a baseline for the workshop going forward. The panelists and participants generally agreed that high tensions between geopolitical rivals have raised the risks of nuclear use. Furthermore, there has been a noted increase in the salience of nuclear weapons in national doctrine and strategy, which not only impacts the risks of nuclear use but also long-term nonproliferation efforts. The discussion identified four general pathways to nuclear use: doctrinal, escalatory, unauthorized, or accidental. While these four pathways are unique, they all interact and result in a variety of specific risk profiles.

The panel was particularly concerned about misunderstandings or miscalculation between nuclear-armed states during an escalating conventional crisis, citing this interaction as the most likely pathway to nuclear use. The interaction of poor bilateral relations between nuclear states, the close proximity between nuclear-armed or nuclear-capable military activities that utilize new and emerging technologies, and the crumbling arms control agreements all increase the risk of miscalculation or misunderstanding. Furthermore, the threat vectors and attack surface areas have grown to include categories that did not exist in the past, therefore the pathways to nuclear use have both deepened and broadened. This is compounded by the evolution from a bilateral to a trilateral competition between the largest nuclear powers. This shift makes it difficult to apply historical lessons and set boundaries on nuclear issues that now involve more complex national interests.

New technologies held a central point in the conversation. Certain new technologies, or novel applications of older technologies might be stabilizing or deterring during peacetime, but become destabilizing in times of crisis. Based on where we are on the technology development pathway, some participants believed that the strategic community has some time to consider the consequences of these new tools before there is a need to arrive at a decision. The discussion also noted that new technologies and tools for conflict are not inherently destabilizing or dangerous, but the uncertainty introduced by these systems threatens to force leaders into decision making without sufficient time and credible information. For instance, it is unclear how artificial intelligence and machine learning will feature in military nuclear systems, if at all. However, difficulties in testing the integrity of mission support systems make it impossible for an adversary to communicate launch decision processes, which in turn erodes confidence in perceptions and gives rise to potential misunderstandings.

The lack of confidence in AI-assisted nuclear systems might also extend to actors within a given system. Without a comprehensive understanding of how the system works and what potential shortfalls may be, there is no opportunity for nuclear operators to second guess or give human-centric context to a potential AI-actuated decision. AI- and machine learning-enabled systems may end up handcuffing the operator and the state to dangerous decisions. These systems are believed to be infallible or at least able to process information and decipher patterns much

faster and more accurately than a human operator could, but the findings are presented without explaining methods or context. This is especially concerning in nuclear states that have questionable safety and security measures, or domestic incentives to take action without alternative analyses or dissent. However, AI should not be entirely excluded from strategic planning and integration with nuclear-related systems. There are opportunities for AI to provide great benefits in fields that do not require machines to assist in or take over decision making.

While much of the conversation focused on the risks and dangers of applying new technologies to crisis management, participants recognized that the time scope of crises and escalation dynamics can vary broadly. While some new technologies might shrink the decision time that leaders have to respond to an incoming attack, these attacks will likely stem from existing crises that occurred over a long period of time. In this sense, nuclear risk reduction strategies begin far before considerations of how to respond to nuclear attacks, and should include escalation management practices. Thus, the strategic planning community should consider addressing crisis responses within a broader context and a longer timeframe. These types of technologies could also enable decision makers to beneficially extend the timeframe for crisis response, an angle the international strategic community has yet to fully address as much of the discussion has been framed around eliminating negative externalities.

Clearly, some applications of new technologies could lead to a decline in strategic predictability that acutely increases nuclear risks. However, there was a modest appreciation for the countervailing opinion that increased nuclear risks might introduce concurrent caution in decision making, but the unpredictable or inadvertent factors previously mentioned negate or largely nullify this effect. Participants noted that expectations and perceptions are key in understanding the impacts of new technologies. Primarily, the debate should make an effort to better recognize how the impact of new technologies would be demonstrably different from the prevailing expectations. This divergence between expectation and reality is likely the main driver of technology-related risks. Greater risks can also fuel action-reaction cycles and lead toward greater danger. Arms racing behavior in new technologies was identified as a potential risk-increasing phenomenon, but states could also engage in these interactions as signaling competition short of war.

The lack of meaningful dialogue on strategic issues between the nuclear-armed states stood out as another specific concern. The historical record shows periods of acute tension between nuclear powers, but these periods have been punctuated and complemented by significant dialogue even in the face of acrimonious relations. This is perhaps the missing link in the modern era of nuclear power competition that would reduce the level of nuclear risks. Workshop participants voiced widespread support for sustained and regular dialogue on existing and emerging topics between nuclear adversaries, especially in the US-Russia context in which there is a longstanding history of such interaction. While the NATO-Russia Council has been active, it has not been successful in resolving the tensions between Moscow and the Alliance. This concern was tied to a general lament that the US capacity among government officials to engage with counterparts has gone missing over recent years.

Panel 2: Taking Stock of Risk Reduction Strategies in 2020

- Over the last 50 years, what has worked and what hasn't? Why?
- How does a changing political context, both international and domestic, affect these strategies?
- What impact will new forms of technical competition have on risk reduction?

Regarding the achievements and failures of the past 50 years, the Intermediate-Range Nuclear Forces Treaty (INF) was mentioned by the panel in both categories. Even though it was bilateral in nature, NATO was heavily involved in the agreement. The extensive nature of the verification measures guaranteed that the US and the USSR (later Russia) eliminated all ground-launched intermediate-range missiles and their warheads. However, due to Russia's violations, the treaty collapsed in 2019. Panelists discussed whether continuing the inspection regime would have prevented the problems that eventually led to the INF Treaty's collapse. Some argued that this outcome was the failure of Russian diplomatic effort and skill, questioning why Russia did not come up with a formal proposal to adjust the agreement to its needs, why they did not raise their concerns in the SVC consultative meetings, or why they did not withdraw from the treaty cleanly. At the same time, other participants criticized the US government for not providing enough information after publicly declaring that Russia violated the INF in 2014. It was argued that this might have been true in the previous administration but the current one has provided plenty of information to the allies, who could then form their own opinions about Russia's non-compliance. This is the reason why allies were so strongly against the Russian moratorium proposal, and why they sided with the US to Moscow's great surprise.

In the past, nuclear arms control measures were mostly implemented in a bilateral manner, and broader risk reduction efforts were attached to an Alliance system. In the future, however, arms control is likely to be broadened to a format of smaller groupings like the trilateral US-Russia-China initiative or the P5. In a discussion about the changing political context, panelists highlighted that both nuclear and conventional cooperative efforts have decreased. Even when Russia engages in confidence-building measures, the initiatives are only implemented in a circumspect and sporadic manner. Unlike Europe, Asia does not have a strong culture of negotiated nuclear constraints and it is difficult to make it a national security interest for China. It is also hard to imagine transferring the tailored European agreements and policies to the Asia theater. Key problems and concerns shared between Russia, the US, and Europe led to cooperative measures but these concerns are not really applicable in Asia.

Moreover, in the current geopolitical environment, some countries simply do not want to engage in extensive risk reduction measures that would stop them from threatening their enemies, or they do not want to embrace transparency measures that could carry accusations against them later. In the future, formal negotiations are likely to be sidelined due to hostile relations among the states and domestic politics, as well.

However, informal communication will be extremely important and valuable to make sure that messaging in clear.

The panel argued that since the Cold War, the assessment of nuclear risks has become much broader, and besides the risks associated with the use of nuclear weapons, the risks of safety and security, accidents, unauthorized use and technological failure have become growing sources of concern. The spectrum has been expanded and some priorities and tradeoffs have to be made. Prioritization is specifically important in the context of nuclear risk reduction. Every risk is defined by the severity of danger, and they should not be handled the same way. Risks emerging from technical malfunction are fundamentally different from the risks of escalation. While some risks are the result of negligence, others are the result of deliberate ambiguity. The lack of communication can increase the chances of miscalculation and create crisis instability.

In general, reducing risks can decrease the chances of deliberate war, and in some cases, it can also increase the credibility of deterrence and second-strike capabilities. In the past, certain risk reduction measures have been more resilient to crisis than expected. The best examples are the Hotline Agreement or the Ballistic Missile Launch Notification Agreement between the US and USSR (later Russia). This latter agreement will still be in effect, even if New START is not extended. There is also a need for non-nuclear confidence-building measures. Risk reduction measures in non-nuclear capabilities can reduce the risk of nuclear use since one of the most likely pathway to a nuclear war is an escalating conventional conflict between nuclear-armed states. Conventional risk reduction measures can help to establish acceptable and unacceptable behavior, reduce strategic uncertainty, identify the threats in a timely manner, mitigate the security dilemma, and test the willingness of partners. Europe has a long history of these measures, including the Vienna Document and the Open Skies Treaty.

In terms of verification, there are inherent difficulties. Even though it would provide a higher confidence regarding the implementation of an agreement, the "anywhere/anytime" type of inspections are not likely in the nuclear domain. So many highly valuable classified programs are co-located with nuclear assets, and neither the US, nor Russia would allow inspectors to just wonder around these locations. Besides, there is a lack of political willingness as neither Russia, nor China want advanced verification with the US.

Panel 3: New Bilateral Approaches? The US-Russia Dimension

- Is there a viable pathway forward for arms control? What innovations might be necessary?
- Are there viable informal measures?
- Do the political and other conditions exist to cooperate to reduce nuclear risks, including a shared assessment of risk?

This panel examined the future of bilateral risk reduction measures between the US and Russia. Most participants agreed that extending the New START Treaty would guarantee more benefits than risks for both sides. If the agreement is not extended beyond 2021, Washington and Moscow will be in a world without bilateral arms control treaties for the first time in decades. However, some participants argued that this would not be the end of the world, and not necessarily the end of arms control. In such a case, both the US and Russia would need to launch a serious internal review on what this loss means for strategic stability, and how they want to preserve elements of the treaty-based regime. If the restrictions of New START no longer apply, Washington and Moscow would also need to examine what kind of opportunities this opens up. However, in the medium-term it is unlikely that Washington could engage in a new arms race in strategic offensive capabilities. Due to Congressional politics and the timeframe that is needed to build new missiles, deploying new capabilities would take at least 5-10 years. During this time, the US and Russia would have the opportunity to negotiate a new agreement and avoid a costly arms race.

From a US perspective, there is a growing skepticism about the bilateral pathway. This skepticism comes from three sources: first, the long history of Russian non-compliance with arms control measures; second, the ongoing modernization efforts in Russia that introduced a number of new capabilities; and third, the increasing relevance of the strategic competition with China. In light of these developments, the Trump administration prioritizes a trilateral dialogue that brings both Russia and China to the table to address nuclear dangers.

However, this new approach does not mean that the administration stopped pursuing bilateral solutions. Although the ultimate goal is the trilateral format, the US could opt for a sequential strategy and start with the pursuit of separate bilateral channels with Moscow and Beijing to kick-off the process. This would require high level political attention on all sides. Despite the tensions, the dialogue between the US and Russia continues: in the last six months there were two rounds of US-Russian strategic security talks, which is a good venue to set the perimeters of future risk reduction measures. At the moment, the environment for cooperation is tough, and arms reductions are unlikely under the shadow of great power competition. The most realistic near-term steps are confidence- and security building measures. Over the next decade, the Russian stockpile is likely to grow, partly due to Moscow's violation of the INF Treaty, and partly due to the new strategic offensive systems. From a US perspective, these new capabilities complicate the arms control negotiations. Taking into account the growing disparity in missile forces and non-strategic nuclear weapons, any future arms reduction agreement should be based on the "freedom to mix" principle.

From a Russian perspective, the biggest arms control issue is the extension of the New START agreement. Russia proposed an extension and confirmed that they would count the Avangard and Sarmat systems under the New START framework (rumors suggest that maybe even the Kinzhal system would be considered treaty accountable). This creates a good opportunity for the US to limit some of the new Russian weapon systems. Regarding the US-Russia-China trilateral framework, Russia is skeptical as no official

proposal has been presented yet. Moscow also emphasizes that before the 2021 expiration of New START, there is no chance to negotiate a completely new agreement, which strengthens the case for extension. For the next round of arms control, Russia is looking at potential tradeoffs. In order to convince Moscow to limit its non-strategic nuclear weapons, the US will need to put on the table its own forward deployed non-strategic nuclear weapons, as well as its ballistic missile defense capabilities. For Russia, it does not mean a return to the ABM Treaty, but some kind of legally binding limitation.

Some participants argued that this may be possible as missile defense hawks in Washington are also budget hawks and some kind of agreement would be possible where the US sticks to a limited missile defense capability that protects against rogue states but does not undermine Russian strategic deterrent. The two sides could also resurrect the Obama administration's transparency proposal and share the trajectory of their BMD developments for the next 10 years, formally reviewing these declarations each year, and leaving the door open for a withdrawal is either side is acting in bad faith. At the same time, other participants argued that legally binding limits on missile defense will never go through Congress. Instead, Washington could offer a ban on space-strike weapons. With the introduction of new Russian systems, Moscow might not be so worried about US BMD capabilities, and space-based weapons could get more attention in future talks.

With regards to informal measures, Russia might be open to the idea of a reciprocal statement on prohibiting weapons in outer space. Besides, Moscow also continues to advocate for its moratoria proposal on INF weapons in Europe. One of the participants argued that NATO should not dismiss this proposal – a moratorium agreement would prevent the US from deploying INF systems in Europe (which seems to be important for most allies), while it would also mean a face-saving solution for Russia to get rid of the 9M729 weapons without publicly acknowledging their existence and the INF violation.

Since the US is more transparent than Russia, transparency measures would bring more benefits to the US. Thus, if the US wants to pursue this agenda, it will need to promise something "extra" for Russia. Moscow believes that if there is no formal agreement between the US and Russia, there is not much room for risk reduction measures. Besides, risk reduction is not necessarily popular in Russia due to the fear that nuclear risk reduction might divert the competition to other domains and destabilize the strategic balance through an arms race in non-nuclear capabilities.

Panel 4: The China Dimension

- How does China assess nuclear risks and dangers?
- What is China's approach to nuclear risk reduction?
- Are there any conditions under which China would become a partner to new measures, including but not limited to a trilateral arms control process?

This panel began with a discussion on the potential risks of nuclear use in the Chinese context. Some participants argued that one major risk factor in the Asia-Pacific relates to the recent changes in nuclear doctrine and forces. From a Chinese perspective, the US decision to introduce new low-yield weapons is an indication of lowering the threshold of nuclear use. Counterarguments emphasized that the development of low-yield nuclear weapons was aimed to convince adversaries not to use their non-strategic nuclear weapons in de-escalatory strategies, and these systems were critical for deterrence.

Panelists also discussed the notion that China views the new US nuclear doctrine as dangerous. From the perspective of Beijing, the United States seeks to fundamentally undermine China as a country. It was also noted that Washington and Beijing have differing views on the potential pathways of escalation, which has proven to be problematic in diplomatic engagement. Panelists argued that the most likely pathway to a war between the United States and China would emerge from a conventional conflict over Taiwan. While the US and its allies are afraid that a conventional conflict could escalate into a nuclear war, the Chinese tend to think that it is unlikely that a conventional conflict would lead to a nuclear exchange. Panelists suggested that there are two reasons why the Chinese thinking on this issue is so different from the US thinking. First, the Chinese do not have the same experience of fighting a conventional conflict, which creates divergent beliefs on this subject. Second, China has not suffered significant losses in conventional wars and this has allowed its leaders to believe that they can engage in high stake conventional conflicts without risking nuclear escalation.

Chinese officials also strongly advocate that the United States must adopt a no first-use policy. If the United States is willing to embrace a no first-use declaration, it would actively address Chinese concerns about American missile defense systems in the region. In addition, an American no first-use policy would also calm Chinese concerns about the threat of a US first strike. For China, a no first-use doctrine is important to establish mutual confidence. Participants argued that if Beijing wants the United States to adopt a no first-use policy, it needs to address the security concerns of US allies first as they are the primary reason why the US rejected this option in the past. To China, accepting mutual vulnerability is critical in establishing better communication and dialogue with the United States. Despite the different views on escalation, nuclear thresholds and doctrine, there is space to for the United States and China to make mutual concessions and cooperation.

The fact that China has resisted the US invitation to join the strategic stability talks suggests that this engagement is not a priority issue for China. The Chinese appear to have been satisfied with Track 1.5 and Track 2 dialogues, while Washington sees a strong need to have Track 1 conversations with China. The United States wants China to engage in broad discussions that can only be managed on the government-to-government level, but China has been reluctant to engage in this conversation. The United States appears to be ready for a dialogue, while China does not. The Trump administration is correct in its assessment that China poses the largest risk to the United States in the long term, but it is wrong to emphasize the nuclear dimension of that.

On the nuclear level, the United States and China share the belief that maintaining the current nuclear balance is acceptable, but this does not apply to the conventional military level. China would like to establish conventional superiority, particularly in the South China Sea. This area is highly contested, and many participants argued that the risk of a conventional confrontation leading to nuclear escalation is growing. The introduction of hypersonic weapons, the increasing missile capabilities, the deployment of new nuclear weapons, the developments in early warning capabilities on the Chinese side, and the lack of effective communication could increase the chances of miscalculation, reduce decision time and increase escalatory pressures. With regards to preliminary cooperative measures, panelists argued that it should be relatively easy to conduct a dialogue on cyber capabilities, artificial intelligence, and other emerging technologies because of shared concerns between China and the United States.

Panel 5: New Multilateral Approaches? The Nuclear Agenda

- What can P-5 cooperation reasonably be expected to deliver?
- How will the Ban Treaty affect the risk-reduction project, practically?
- What more can and should be done to reduce nuclear dangers in South Asia? In other regions? By the UNSC? Outside the UNSC?

The panel began with a discussion of why the risk of a nuclear war is so high today. Three main reasons were outlined: 1) misperceptions surrounding China and Russia; 2) miscalculation of actions and inactions; and 3) missteps. The risk of nuclear war has also extended beyond the great powers, and new actors joined the field. Among the P5 states, consultations are only periodic and proverbial. For the P5 to make progress, the participants have to broaden, deepen and transform the entire process. In terms of broadening, the P5 should be focused on gradually adding new items to the agenda and creating a new P5 working group on crisis management, avoidance, and risk reduction. The deepening element should pursue serious, in-depth discussions on nuclear doctrine, and the transformation would require a new approach to the participating diplomats. According to a panelist, the P5 discussions are conducted by NPT diplomats who are not necessarily the right people to address broader strategic stability or doctrinal issues. P5 countries should commit to include people from the deterrence and strategic communities.

Additionally, in the current environment there is a need for more bilateral discussions and the P5 meetings can become a platform for that. So far, the P5 had a better record in talking about general problems, than talking about problems among the members. But the P5 process is not inconsistent with the idea of more in-depth bilateral discussions. It could potentially make it more difficult for China to dismiss bilateral talks with the US – although some participants of the panel questioned whether China is ready for bilateral talks beyond the NPT framework.

Beyond the steps that the P5 could take on nuclear risk reduction, discussions must start on how to address the risks in South Asia and how to find a way to engage India and Pakistan. When the international community looks at South Asia, it generally refers to bad deterrence practices, poor signaling, the dangers of nuclear terrorism, fears of a rogue commander, and bad or inadequate safety measures. Another difficulty in the region is that India and Pakistan rarely take recommendations from the outside world, they mostly prefer their own indigenous approaches. Similarly to the great powers, the main nuclear threat comes from the potential escalation of a conventional conflict. After the most recent conflict between India and Pakistan, both sides declared victory and claimed that they managed to control escalation. Due to a significant amount of luck and some calibrated steps the real threat of using ballistic missiles was avoided, but the confidence of both states in their ability to control escalation might become dangerous in a future crisis.

Over the past years, there were many bilateral talks on confidence-building measures but the value of them is rather symbolic as they do not address crisis mitigation mechanisms. It is easier to succeed in risk reduction if the states have an approximate symmetry in posture, risk perception and capabilities. In the case of South Asia, none of these really apply. The asymmetries between the two countries put pressure on the weaker state to escalate quick and restore deterrence, while the stronger country might question the credibility of the weaker state's deterrence posture and risk escalation from a perceived position of strength. These dynamics have serious escalatory dangers, and make formal risk reduction measures difficult. Instead, a normative process might be the best way forward (for example, the non-attack agreement on cultural sites, a mutual no-first use declaration, or a non-attack agreement on C2 systems).

The landscape is further complicated by the US and China interaction, and the fact that China's role in the region has become more significant in the past 20 years. In the most recent conflict, the US played an important role in trying to slow down the evolving crisis, but the potential of outside countries to manage escalation in the region is narrow. With regards to multilateral forums, there is a general negative sentiment towards the UN Security Council, as the memory of the 1998 sanctions is still strong.

In terms of East Asia, participants noted that the key issue is whether the US and South Korea can accept the DPRK as a nuclear power. This possibility would open up the space for actual arms control measures and a discussion on how to create stability. Many combinations of negotiations (the US-DPRK bilateral framework or the Six-Party Talks) have a questionable record. It is possible, but not clear, if China is willing to do more to find a diplomatic solution. Besides, it is also uncertain if the DPRK trusts China enough to take that role. Participants also raised the issue of interconnectedness, and wondered how strongly the regional competition is tied to great power competition. If the great powers manage to agree on risk reduction measures, we might see a spill-over effect to regional competitions.

On the question of how the Ban Treaty can practically affect the risk reduction project, there was a wide agreement that it will not have any influence on the behavior of great

powers. The Ban Treaty is a signal that non-nuclear weapon states are deeply worried about the lack of progress on disarmament, and the P5 should address this issue by assuring the non-nuclear weapon states that their NPT commitment is taken seriously. One possible way to prove this commitment is a strong risk reduction agenda that they are ready to implement. No serious response from the P5 countries to this frustration could potentially undermine the NPT regime, which is more important for the P5 states than to the non-nuclear weapon states.

Panel 6: New Multilateral Approaches? The New Technologies

- What do existing approaches, if any, contribute to risk reduction?
- What new approaches are in consideration, both formal and informal, and what are their strengths and weaknesses?

The panel focused on two specific issues: outer space and cyberspace. The speakers outlined the issues in each and identified potential pathways to improved stability and risk reduction activities. Many of these proposals reflected increased international attention to these issues in multilateral and international forums, but complications remain in pursuing these solutions. The normative approaches in both domains have faced and are expected to continue to face challenges. The relationship between norms and international law is yet to be clearly defined in both outer and cyber spaces, and the voluntary, politically binding, or non-binding commitments provide little recourse and opportunity for compliance verification and enforcement. One normative similarity between the two domains is the apparent norm of a commitment to not kill. However, there is a universe of activity below this threshold that remains unregulated or unaddressed. This panel built on prior CGSR events on strategic competition in outer and cyber space, specifically reinforcing the importance of private sector engagement.

Outer Space

While risk enhancing behavior in space is generally an extension or reflection of geopolitical tension and competition that is occurring on Earth, this is a one-way street. Friction between adversaries does not always translate across domains, and outer space is not always included in states' escalatory pathways. However, this does not diminish the potential destabilizing effects of conflict in space. First and foremost, kinetic interference with satellites is an exceedingly dangerous activity, followed by other secondary types of counterspace capabilities like laser or electronic interference. While there have only been a few kinetic energy anti-satellite (ASAT) tests, none of these tests have occurred during periods of extreme tension. Furthermore, the states that have tested these types of capabilities are usually reticent to carry out more tests after initial success, a pattern that sits in stark contrast to the history of nuclear weapons tests. It should be noted that the relative absence of counterspace testing does not necessarily indicate a lack of obtained capability. The modest implementation patterns potentially indicate that states do not see the military utility in kinetic counterspace capabilities. As non-kinetic ASAT tests are more difficult to observe, a more holistic recognition of ASAT use might disrupt these assumptions and conclusions.

Expanding on this initial understanding of counterspace technology, it is also clear that there are no instances of space warfare between major powers, even as deterrence has broken down in other domains. This indicates that deterrence in space warfare might be stronger than most assume. However, framing the existing dialogue about conflict in space as "not whether, but when" is deeply unhelpful for progress in stabilizing norms of non-belligerence and deterrence. To buttress these norms, many countries have supported or presented diplomatic language that, if adopted, would restrict military applications of certain counterspace capabilities.
This is most notable in the Prevention of an Arms Race in Outer Space (PAROS) debate. The panelists discussed the evolution and impact of a potential arms race in outer space, but dismissed the possibility based on the inability of the Russian Federation to finance such a competition and China's apparent disinterest in engaging in a strategic arms competition in space. Deterrence, coupled with diplomacy, would help quell concerns in this area. However, the most capable countries have been unable to engage in diplomacy on the topic. This leaves formal treaties or politically binding commitments far-off possibilities. Instead, the panelists supported normative and behavioral restraints to address future issues in space.

Even if diplomatic overtures were suddenly accelerated, outright bans on ASAT or regulations on the use thereof might be a lesser solution to establish norms in space. Efforts to create normative guidelines began over twenty-five years ago, and have gained little traction since, but a ban has been and will likely continue to be stymied by scoping issues on both a technical level and a negotiating party level. Furthermore, assigning an enforcement date to a ban would signal a "due date" for ascending space powers to develop and test ASAT weapons before the capability was banned. In parallel to developing norms in outer space, the international community should focus on reinforcing the existing normative framework.

Cyberspace

The international regulatory approach to cybersecurity has roots in existing approaches to arms control and risk reduction strategies in other domains. Multilateral channels like the UN have supported efforts to regulate the way state actors use cyber capabilities in the context of international security. The discussion has been energized by the pursuit of a legally binding treaty to bring stability and predictability to the domain. These efforts have a mixed history: Russia and China have offered proposals, but the US and likeminded states have rejected these plans. The disagreements between blocs grows from fundamental disagreements about what should be regulated – the likeminded states seek a regulatory framework to manage the specific types of code and potential uses of these tools; while the other group of states has approached these negotiations with an intent to regulate content, which gives rise to cyber human rights concerns. Further complicating this cyber diplomacy, continued information warfare has introduced a wedge in doctrinal alignment efforts. These differences highlight some of the other imbalances between state actors in cyberspace, namely that the risks and vulnerabilities are unequal and uneven among sovereigns. This extends across the spectrum of corporate entities, cyber service providers, and end users.

Much of the international discussion on cyberspace has been framed in either a strictly legal or a strictly normative way. Because international law is a difficult topic for the cyberspace community, the Thermidorian reaction pivoted the conversation to softer norms without any stops in between. Non-legally binding efforts like voluntary export controls (for example those

established in 2013 through the Wassenaar Agreement's coverage of "Dual Use Goods and Technologies") have failed spectacularly as some of the most impactful states have yet to implement the voluntary guidelines. This has cleaved a rift between some of the major state powers in cyberspace but has also alienated the private sector and industrial actors who were unappreciative of the inflexible nature of the regime.

Civil society, industry, and the technical community remain important stakeholders in this debate. These entities generally tend to push for and support state-to-state engagement to mitigate the spillover effects from sovereign cyber activity that damages industrial ability to provide services to end-users. Industry has also been subject to increased regulation from states and supranational organizations. the EU has become the spearhead in setting standards for end-user privacy protections. This privacy-affirming regime may serve as an effective lever to apply critical concepts of international law to cyberspace. The limits of privacy also may be effective fenceposts to demarcate the limits and borders of sovereign and international cyberspace.

Other options like the iterative sessions of the Open-Ended Working Group and Group of Governmental Experts on cyber issues have advanced a normative framework for responsible state behavior in cyberspace. The set of measures included transparency and confidence-building measures, norms, capacity building efforts, and applications of international law. While this has been generally agreed to, the implementation and operationalization are still far afield. Some states are not ready or unwilling to apply international humanitarian law principles to cyberspace. This is further complicated by unaligned perspectives across states regarding where the international domain ends and where the sovereign "territory" begins.

Panel 7: The Roles of US Allies

- What can US allies, nuclear-armed and otherwise, contribute to risk reduction?
- In relations with neighboring major powers, can allies accomplish something useful for risk reduction that the United States cannot?
- In dealing with the competing demands of disarmament and deterrence, what strategies have US allies adopted? How will this impact NPT diplomacy?

This panel looked at the roles of US allies in the Asia-Pacific and Europe, examining what they can do to reduce nuclear dangers in concert with the US and what they can do on their own. Allies in both regions face nuclear dangers, therefore they are equally motivated to support the US in risk reduction measures. At the same time, they are also dependent on the US for security guarantees, which means that they do not want to undermine the credibility of US deterrence. Despite these similarities, there are many differences in the nature of risks and threats, which requires tailored strategies in both regions.

In the Asia-Pacific, the primary concern regarding China is the potential of a conventional conflict that could erupt due to a Chinese attempt to change the status quo over the islands in the South China Sea, or an attempt to change the status quo regarding Taiwan.

Japan is afraid that miscommunication or misinterpretation of US alliance management might trigger China to take aggressive measures. Japan is also afraid of an unregulated arms race between Washington and Beijing. Regarding North Korea, it seems that the region is forced to co-exist with the nuclear capabilities of Kim Jong-un, who might use nuclear coercion to achieve his goals in the future.

To address the above challenges, Japan advocates for a comprehensive approach that merges deterrence and arms control. The goal of deterrence is to impose costs on the adversaries for escalating a conflict, and also to strengthen alliance capabilities to shift from extended deterrence towards a more sustainable "alliance deterrence" concept. From a domestic perspective, it is difficult for Japan to support a massive build-up of US offensive capabilities on Japanese territory (it is highly unlikely, for example, that Japan would be willing to host land-based intermediate-range weapons – even if they are "only" conventional). Therefore, Tokyo prefers a deterrence by denial approach that emphasizes the modernization of ballistic missile defense systems.

At the same time, Japan advocates for threat reduction through arms control measures. Japan supports the extension of the New START agreement, and it also supports the extension of the bilateral arms control process to include China. Due to their own history with nuclear weapons, Japan is an advocate of compliance with humanitarian law in nuclear operations. They also hope to play a bridge-building role in multilateral forums, such as the NPT, and they support political initiatives which are shaping and narrowing China's maneuvering capability.

European allies are in a slightly different situation when it comes to coordination with the US. While the Alliance projects unity towards the outside world, NATO is a "safe space" for allies to have a conversation on the security environment, to pressure the P3 to do more on arms control, and to share initiatives on risk reduction. NATO also collectively works to engage with Russia and China on nuclear dangers. NATO continues to have a dual-track approach towards Russia, which means strengthening deterrence, while also leaving the door open for dialogue and cooperation. Risk reduction is considered to be part of both of these legs. Among the allies, there is no prioritization in nuclear risks, but the fall of the INF regime was definitely seen as a major threat for Europe. Therefore, NATO needs to have a range of options to respond to Russia's non-compliance. The US constantly briefs the allies about developments in intermediate-range systems but at this point there is no talk about deploying land-based intermediate-range weapons in Europe. And even if it happens, a decision would only be made with the consent of all member states.

As the NATO-Russia Council (NRC) continues to operate, it is seen as one of the few remaining venues to promote multilateral approaches to risk reduction, and to address issues like cooperation on missile defense. In the past, the NRC has been used successfully to reduce risks by exchanging details about exercises or talking about hybrid warfare. While the US used the NRC to build a case about Russian non-compliance with the INF Treaty, Russia have not really pushed proposals in this venue, and it also have not used these channels to share specific details about its INF moratorium proposal. NATO

continues to promote a strong agenda for arms control and risk reduction, but this narrative brought only limited results with Russia. Regarding multilateral forums, European allies are among the strongest supporters of the NPT regime. NATO emphasizes that implementing the NPT obligations is a shared responsibility of nuclear-weapon states and non-nuclear weapon states as well. At the next NPT RevCon, the Alliance is going to make a joint statement to express their continued support for the regime.

Panel 8: New Unilateral Approaches?

- What role have unilateral US actions played historically?
- What new steps by the United States are in discussion?
- If implemented, what would be their net impact on nuclear risk and danger?

This panel began with a discussion on the difficulty of the United States to pursue unilateral actions in the current security environment. The most relevant historical examples of unilateral actions are the Presidential Nuclear Initiatives of 1991 and 1992, which eliminated a great variety of nuclear weapons through coordinated unilateral measures between the US and Russia. President Bush was concerned in 1991 that the Soviet Union was about to collapse and wanted to reduce the dangers of loose nuclear weapons in the post-Soviet space. Besides, the US also believed that the collapse of the Soviet Union offered a unique opportunity to shift away from the Cold War force posture.

Because of the Presidential Nuclear Initiatives, both the US and Russia implemented dramatic reductions in their nuclear arsenals. The biggest downside of these unilateral measures is the challenge of enforcement and verification. The PNIs did not include regular data exchanges, no accounting rules, and no verification by either side to confirm that the proposed reductions were occurring. Although there were intelligence estimates, there was no precise data about the actual numbers of dismantlement in non-strategic nuclear weapons. In 2001, President George W. Bush tried to replicate the 1991 and 1992 Presidential Nuclear Initiatives. After an internal review of US nuclear doctrine and forces, he was ready to announce lower numbers (than the START I agreement) for deployed strategic nuclear weapons. His administration wanted to come down to these numbers unilaterally, without a legally binding treaty framework. However, President Putin insisted on a treaty framework, so in the end Washington and Moscow concluded the Strategic Offensive Reductions Treaty.

These historic examples raise the question why the US would want to take unilateral steps. Potential explanations include: lowering tensions, reassuring adversaries about US intentions, inducing reciprocal steps by the adversaries, saving money, getting arms control credit in the international arena, or advancing arms control by putting conditions on unilateral steps and promising reductions in exchange for similar measures by the adversary (which do not necessarily need to happen in the same domain). Despite these

potential motivations and benefits, in the current environment of great power competition, it is much more difficult to consider unilateral steps than it was in the past.

Potential unilateral measures that were mentioned are grouped into three categories. In nuclear force structure, the US could limit its W76-2 low-yield SLBM warhead, scale back the LRSO program, implement reductions in the ICBM force, declare that Washington will not exceed the New START numbers even after the treaty's expiration, or pledge to keep all ground-based intermediate-range systems conventional. In nuclear doctrine, the US could move to adopt a sole purpose posture or reiterate the "3 no" promise that was included in the NATO-Russia Founding Act. With regards to transparency and confidence-building measures, Washington and Moscow could make parallel unilateral promises to continue the New START data exchanges, or to implement the BMD transparency proposal of the Obama administration. It was also mentioned that the US could invite China for a mock New START inspection, or share these transparency information with Beijing in order to trigger a constructive dialogue on nuclear forces.

Many of these proposals were heavily contested by other participants. Some argued that withdrawing the W76-2 low-yield warhead was wise as the weapon is dangerous and it increases the risks of nuclear use. Other participants argued that the W76-2 was critical to strengthen deterrence, particularly vis-à-vis Russia, and the fears about lowering the nuclear threshold were misguided because it was publicly stated that the W76-2 would only be used in response to a Russian use of nuclear weapons first. Regarding the proposals on doctrinal changes, participants argued that a sole purpose policy was a dangerous idea, especially with regards to allies who would see it as a weakening of alliance commitments, and instead the United States should focus on reducing risks without compromising deterrence.

A different set of recommendations approached risk reduction from a technical angle. These ideas included: improving the survivability of NC3 systems with a lot of built-in redundancy; fixing the gaps in safety and reducing the risks of spontaneous and technical failures; expanding the implementation of nuclear security measures; improving personnel screening; preparing for counter-takeover measures; wargaming cases of a false indication of an incoming attack, hardening warning and detection systems; and in general, maintaining highly survivable forces. Many of these unilateral measures could reduce the pressure and time constraint on the decision maker in a crisis situation.

Panelists also discussed the role of the President in nuclear risk reduction. The current system gives the President of the United States absolute unilateral executive authority to use nuclear weapons, the basis of which is the Constitutional assignment of the President to be the commander in chief. There is a long and necessary process for the President to make a decision on nuclear use. In this regard, the panelists examined the benefits and dangers of this sole authority, and discussed whether more input from other parties in the US government was necessary for a better informed and safer process. However, the majority of participants seemed to agree that ultimately the President needs to be in charge, and the US should not implement a dual-key system with a veto power in someone else's hand. In order to ensure a better informed and safer system, the US

should strengthen the structure that facilitates the Presidential decision, and it would also be useful to involve the President in more nuclear tabletop exercises.

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